REMARKS

In response to the Office Action mailed July 13 2009, Applicants respectfully request reconsideration. Claims 1-20 were previously pending for examination. Claims 1, 10, 12 and 13 have been amended herein. As a result, claims 1-20 remain pending with claims 1 and 10 being independent. No new matter has been added.

Rejection under 35 U.S.C. 112

The Office Action rejects claims 1-20 under 35 U.S.C. 112, first paragraph, as purportedly failing to comply with the written description requirement. Particularly, the Office Action alleges that the limitation, "only on external surfaces of the particles in the active material," was not sufficiently described in the original disclosure. Applicants respectfully disagree.

Applicants respectfully submit that the above limitation is supported throughout the original disclosure, for example, at Fig. 1, page 5, lines 2-8 and page 14, lines 9-17. For instance, the original disclosure states, at page 14, "[t]he fact that the cathode material exhibited battery reactions as mentioned above suggests that reactions occur only on the surface of the active material."

Accordingly, it is respectfully requested that the rejections under 35 U.S.C. 112, first paragraph, be withdrawn.

The Office Action further rejects claims 12 and 13 under 35 U.S.C. 112, second paragraph, as purportedly being indefinite. Without acceding to the propriety of these rejections, Applicants have herein replaced the term "substantially" with the term "observably." These amendments are supported in the original disclosure, for example, at page 14, lines 9-17.

Accordingly, it is respectfully requested that the rejections of claims 12 and 13 under 35 U.S.C. 112, second paragraph, be withdrawn.

Rejections Under 35 U.S.C. 103

The Office Action rejects claims 1-20 under 35 U.S.C. 103(a) as purportedly being unpatentable over Hoffman (U.S. Patent No. 4,894,302) in view of Mayes (U.S. Patent Application Publication No. 2002/0048706). Without acceding to the propriety of these rejections, Applicants have herein amended independent claims 1 and 10 to emphasize some of the distinguishing features. In view of these amendments, Applicants respectfully request reconsideration.

I. Claim 1

As amended, claim 1 recites, "the active material has an average particle diameter as small as 1 nanometer, so that the active material exhibits battery reaction as a result of ions from the ionic conductor interacting with particles in the active material only on external surfaces of the particles in the active material," and "the battery reaction causes no observable changes in lattice parameters of the active material." Neither of the cited references discloses or suggests these limitations.

For example, neither Hoffman nor Mayes describes any "battery reaction as a result of ions from the ionic conductor interacting with particles in the active material only on external surfaces of the particles in the active material." Rather, both Hoffman and Mayes describe rechargeable batteries in which charging and discharging take place via **intercalation** reactions.

In particular, Hoffman describes intercalation reactions as insertion of metal guest ions into inorganic host structures, and further describes the battery reaction of a electrochemical cell as "one of ion insertion" that produces an intercalated product (Hoffman, column 2, lines 21-23, column 6, lines 56-68, and column 7, lines 1-21).

Similarly, Mayes describes intercalation as a reaction in which ions, atoms or molecules penetrate between the layers of a solid material to form intercalation compounds, and further describes a battery arrangement in which lithium ions diffuse within ion host particles (Mayes, paragraphs 0007 and 0106).

Nowhere does Hoffman or Mayes recognize any type of battery reaction other than intercalation. Therefore, both Hoffman and Mayes fail to disclose, "the active material exhibits battery reaction as a result of ions from the ionic conductor interacting with particles in the active material only on external surfaces of the particles in the active material," as claimed.

Hoffman and Mayes also fail to disclose or suggest, "the battery reaction causes no observable changes in lattice parameters of the active material," as recited in claim 1. By contrast, both references acknowledge that **some** changes in lattice parameters, albeit small, occur in the host lattice as a result of intercalation. For example, Hoffman states that, "[t]he phase formed during intercalation retains the physical structure of the parent, for instance, Co_3O_4 with only minor variations being evident in the crystallographic lattice constants of the material" (Hoffman, column 7, lines 5-8). Likewise, Mayes refers to "volume change occurring naturally during charging and discharging of the battery" and "size changes upon intercalation and de-intercalation" (Mayes, paragraph 0106). Although the references indicate that size changes may be undesirable, they both suggest that size changes are necessarily associated with intercalation. Therefore, the references fail to disclose, "the battery reaction causes no observable changes in lattice parameters of the active material," as claimed.

For at least these reasons, claim 1 patentably distinguishes over the alleged combination of Hoffman and Mayes, and it is respectfully requested that the rejection of claim 1 be withdrawn.

Claims 2-9 depend from claim 1 and are allowable for at least the same reasons. Accordingly, it is respectfully requested that the rejections of these claims be withdrawn.

II. Claim 10

As amended, claim 10 recites, "the active material has an average particle diameter as small as 1 nanometer, so that the active material exhibits battery reaction as a result of ions from the ionic conductor interacting with particles in the active material only on external surfaces of the particles in the active material." For reasons that should be clear from the foregoing discussion of Hoffman and Mayes, neither of these references discloses or suggests this limitation. Therefore, claim 10

patentably distinguishes over the alleged combination of Hoffman and Mayes, and it is respectfully requested that the rejection of claim 10 be withdrawn.

Claims 12-20 depend from claim 10 and are allowable for at least the same reasons. Accordingly, it is respectfully requested that the rejections of these claims be withdrawn.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance to discuss any outstanding issues relating to the allowability of this application.

If the response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. Applicants believe no fee is due with this response. However, if a fee is due, please charge Deposit Account No. 23/2825 under Docket No. S1459.70129US from which the undersigned is authorized to draw.

Dated: 9-14-09

Respectfully submitted,

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